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I, Kevin Jeffay, Ph.D., declare as follows:

I. INTRODUCTION

1. My name is Kevin Jeffay, and I have been asked by the parties requesting this review, Amazon.com, Inc., Amazon Web Services, Inc., and Amazon.com Services LLC (collectively “Petitioner”) to analyze U.S. Patent No. 9,762,636 (the “’636 patent”) (EX1001) and to provide my opinions regarding the patentability of claims 1-12 of the ’636 patent.

2. I am being compensated for my time. This compensation is not contingent upon my performance, the conclusions I reach in my analysis, the outcome of this matter, or any issues involved in or related to this matter.

II. BACKGROUND AND QUALIFICATIONS

3. I am a tenured professor in the Department of Computer Science at the University of North Carolina at Chapel Hill where I currently hold the position of Gillian T. Cell Distinguished Professor of Computer Science. I also recently served as the Chairman of the Department (from 2014-2022). I have been a faculty member at UNC since 1989.

4. I received a Ph.D. in computer science from the University of Washington in 1989. Before that I received a M.Sc. degree in computer science from the University of Toronto in 1984, and a B.S. degree with Highest Distinction in mathematics from the University of Illinois at Urbana-Champaign in 1982.

5. I have been involved in the research and development of computing systems for nearly 40 years. I have been a faculty member at the University of North Carolina since 1989 where I perform research, and I teach in the areas of multimedia networking, computer networks, distributed systems, real-time systems, and operating systems, among others. A major theme of my research has been the development of technology to improve the performance of data transfers on the Internet. My research has examined problems ranging from network and operating system support for real-time multimedia applications such as audio and video streaming, voice-over-Internet protocol (VoIP) and Internet videoconferencing, to the design of congestion control mechanisms in network routers, to measurements and analysis of network traffic to passively assess the performance of servers on the Internet.

6. For example, starting in the late 1980s, the focus of my research was the development of network and operating system technology to enable the real-time transfer of streams of audio and video data across the Internet. This involved, among other things, the development of media encoders, media players, and network communication protocols for adaptive transmission of live audio and video data on the Internet. This work culminated in my research group developing some of the first videoconferencing systems for the Internet. Several of the papers authored by myself and members of my research group on this project won awards for their

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